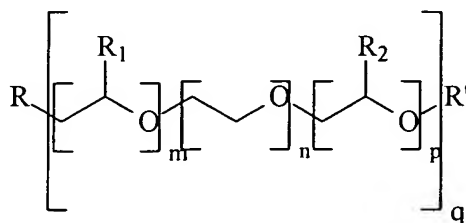


## CLAIMS

1- The use of a weakly ionic and water-soluble copolymer as gloss activator irrespective of the viewing angle, i.e. an angle of between 20° and 85°, and more particularly between 45° and 75°, characterized in that said copolymer has at least one alkoxy or hydroxy polyalkylene glycol function grafted onto at least one ethylenically unsaturated monomer, and in that said copolymer has an intrinsic viscosity less than or equal to 100 ml/g determined in accordance with the method known as the intrinsic viscosity method

2- The use of a weakly ionic and water-soluble copolymer as gloss activator irrespective of the viewing angle, according to claim 1, characterized in that said copolymer consists of at least one monomer of formula (I):



where

- m and p represent a number of alkylene oxide units less than or equal to 150
- n represents a number of ethylene oxide units less than or equal to 150
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- R<sub>1</sub> represents hydrogen or the methyl or ethyl radical
- R<sub>2</sub> represents hydrogen or the methyl or ethyl radical
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group

of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,

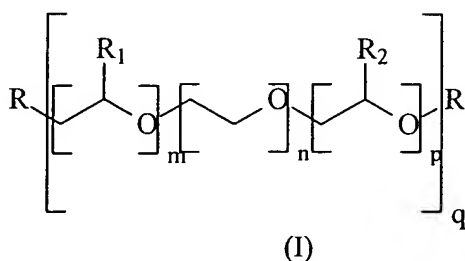
- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical having from 1 to 4 carbon atoms,

and in that said copolymer has an intrinsic viscosity less than or equal to 100 ml/g determined in accordance with the method known as the intrinsic viscosity method.

3- The use of a weakly ionic and water-soluble copolymer as gloss activator irrespective of the viewing angle, according to one of the claims 1 or 2, characterized in that said copolymer comprises:

a) at least one anionic monomer with a carboxyl or dicarboxyl or phosphoric or sulfonic function or a mixture thereof,

b) at least one non-ionic monomer, the non-ionic monomer consisting of at least one monomer of formula (I):



where

- m and p represent a number of alkylene oxide units less than or equal to 150
- n represents a number of ethylene oxide units less than or equal to 150
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- R<sub>1</sub> represents hydrogen or the methyl or ethyl radical
- R<sub>2</sub> represents hydrogen or the methyl or ethyl radical
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic,

maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,

- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several monomers of formula (I),

c) possibly, at least one monomer of the acrylamide or methacrylamide type or their derivatives such as N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, and their mixtures, or at least one non water-soluble monomer such as the alkyl acrylates or methacrylates, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, vinyls such as vinyl acetate, vinylpyrrolidone, styrene, alphas-methylstyrene and their derivatives, or at least one cationic monomer or quaternary ammonium such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulphate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulphate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulphate, dimethyl diallyl ammonium chloride or sulphate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulphate, or at least one organofluorinated or organosilylated monomer, or a mixture of several of these monomers,

d) possibly, at least one monomer having at least two ethylenic insaturations referred to as a crosslinking monomer,

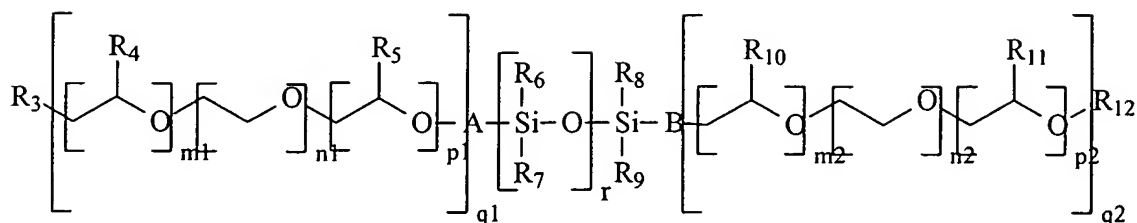
the total of the proportions of components a), b), c) and d) being equal to 100%.

and in that said copolymer has an intrinsic viscosity less than or equal to 100 ml/g determined in accordance with the method known as the intrinsic viscosity method.

4- The use of a weakly ionic and water-soluble copolymer as gloss activator irrespective of the viewing angle, according to one of the claims 1 to 3, characterized

in that the organosilylated monomer is selected from among the molecules of formulae (IIa) or (IIb).

5 with formula (IIa)



where

- 10 - m1, p1, m2 and p2 represent a number of alkylene oxide units less than or equal to 150
- n1 and n2 represent a number of ethylene oxide units less than or equal to 150
- q1 and q2 represent an integer equal to at least 1 and such that  $0 \leq (m1+n1+p1)q1 \leq 150$  and  $0 \leq (m2+n2+p2)q2 \leq 150$ ,
- 15 - r represents a number such that  $1 \leq r \leq 200$ ,
- R3 represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$
- 20 dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R4, R5, R10 and R11 represent hydrogen or the methyl or ethyl radical
- 25 - R6, R7, R8 and R9 represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof
- R12 represents a hydrocarbon radical having from 1 to 40 carbon atoms,
- A and B are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

5        where



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- m3, p3, m4 and p4 represent a number of alkylene oxide units less than or equal to 150
  - n3 and n4 represent a number of ethylene oxide units less than or equal to 150
  - q3 and q4 represent an integer equal to at least 1 and such that  $0 \leq (m3+n3+p3)q3 \leq 150$  and  $0 \leq (m4+n4+p4)q4 \leq 150$ ,
  - r' represents a number such that  $1 \leq r' \leq 200$ ,
  - R<sub>13</sub> represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
  - R<sub>14</sub>, R<sub>15</sub>, R<sub>20</sub> and R<sub>21</sub> represent hydrogen or the methyl or ethyl radical
  - R<sub>16</sub>, R<sub>17</sub>, R<sub>18</sub> and R<sub>19</sub> represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof
  - D and E are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,
- or a mixture of several of said monomers,

and in that said copolymer has an intrinsic viscosity less than or equal to 100 ml/g determined in accordance with the method known as the intrinsic viscosity method.

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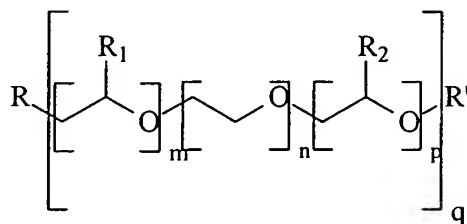
5- The use of a weakly ionic and water-soluble copolymer as gloss activator irrespective of the viewing angle, according to one of claims 1 to 4 characterized in that said copolymer consists, by weight, of:

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- a) from 2% to 95% and, even more particularly, from 5% to 90%, of at least one ethylenically unsaturated anionic monomer having a monocarboxyl function selected from among the ethylenically unsaturated monomers having a monocarboxyl function such as acrylic or methacrylic acid or hemiesters of diacids such as C<sub>1</sub> to C<sub>4</sub> monoesters of maleic or itaconic acid, or mixtures

thereof, or having a dicarboxyl function selected from among the ethylenically unsaturated monomers having a dicarboxyl function such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or anhydrides of carboxyl acids, such as maleic anhydride or having a sulfonic function selected from among the ethylenically unsaturated monomers having a sulfonic function such as acrylamido-methyl-propane-sulfonic acid, sodium methallylsulfonate, vinylsulfonic acid and styrenesulfonic acid or having a phosphoric function selected from among the ethylenically unsaturated monomers having a phosphoric function such as vinylphosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and their ethoxylates or having a phosphonic function selected from among the ethylenically unsaturated monomers having a phosphonic function such as vinylphosphonic acid, or mixtures thereof,

- b) from 2 to 95% and, more particularly, from 5% to 90%, of at least one non-ionic ethylenically unsaturated monomer of formula (I):



(I)

where

- m and p represent a number of alkylene oxide units less than or equal to 150
- n represents a number of ethylene oxide units less than or equal to 150
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- R<sub>1</sub> represents hydrogen or the methyl or ethyl radical
- R<sub>2</sub> represents hydrogen or the methyl or ethyl radical
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic,

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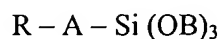
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where



- m1, p1, m2 and p2 represent a number of alkylene oxide units less than or equal to 150
- n1 and n2 represent a number of ethylene oxide units less than or equal to 150
- 5      - q1 and q2 represent an integer equal to at least 1 and such that  $0 \leq (m1+n1+p1)q1 \leq 150$  and  $0 \leq (m2+n2+p2)q2 \leq 150$ ,
- r represents a number such that  $1 \leq r \leq 200$ ,
- R<sub>3</sub> represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- 10      - R<sub>4</sub>, R<sub>5</sub>, R<sub>10</sub> and R<sub>11</sub> represent hydrogen or the methyl or ethyl radical
- R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> and R<sub>9</sub> represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or
- 15      a mixture thereof
- R<sub>12</sub> represents a hydrocarbon radical having from 1 to 40 carbon atoms,
- 20      - A and B are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

with formula (IIb)



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where

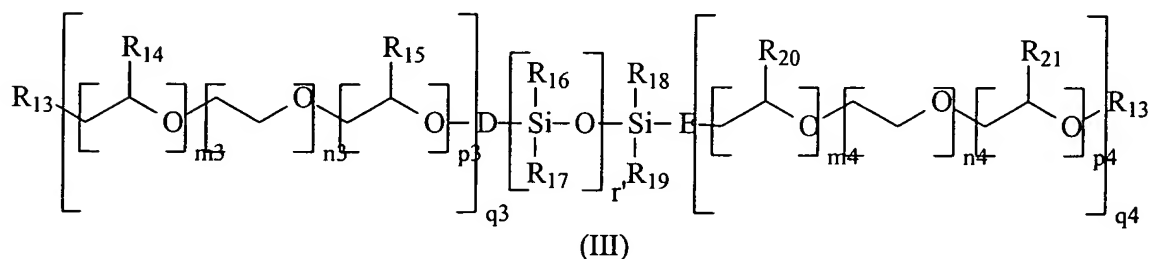
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
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- A is a group which may be present, in which case it represents a hydrocarbon radical having from 1 to 4 carbon atoms,
  - B represents a hydrocarbon radical having from 1 to 4 carbon atoms,
- or a mixture of several of said monomers,

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- d) from 0% to 3% of at least one crosslinking monomer, selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, the allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers prepared from polyols such as pentaerythritol, sorbitol, sucrose, or selected from the molecules of formula (III):

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where

- m3, p3, m4 and p4 represent a number of alkylene oxide units less than or equal to 150
- n3 and n4 represent a number of ethylene oxide units less than or equal to 150
- q3 and q4 represent an integer equal to at least 1 and such that  $0 \leq (m3+n3+p3)q3 \leq 150$  and  $0 \leq (m4+n4+p4)q4 \leq 150$ ,
- r' represents a number such that  $1 \leq r' \leq 200$ ,
- R<sub>13</sub> represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R<sub>14</sub>, R<sub>15</sub>, R<sub>20</sub> and R<sub>21</sub> represent hydrogen or the methyl or ethyl radical

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- R<sub>16</sub>, R<sub>17</sub>, R<sub>18</sub> and R<sub>19</sub> represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof
- D and E are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

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or a mixture of several of said monomers,

the total of the proportions of components a), b), c) and d) being equal to 100%.

and in that said copolymer has an intrinsic viscosity less than or equal to 100 ml/g

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determined in accordance with the method known as the intrinsic viscosity method.

6- The use of a weakly ionic and water-soluble copolymer as gloss activator irrespective of the viewing angle according to one of the claims 1 to 5, characterized in that said copolymer is in its acid form or fully or partially neutralized by one or more neutralizing agents having a monovalent neutralizing function or a polyvalent neutralizing function such as, for the monovalent function, those selected from among the group consisting of the alkaline cations, in particular sodium, potassium, lithium, ammonium or the primary, secondary or tertiary aliphatic and/or cyclic amines such as stearylamine, the ethanolamines (mono-, di-, triethanolamine), mono and diethylamine, cyclohexylamine, methylcyclohexylamine, aminomethylpropanol, morpholine or, for the polyvalent function, those selected from among the group consisting of alkaline earth divalent cations, in particular magnesium and calcium, or zinc, as for the trivalent cations, including in particular aluminium, or by certain cations of higher valency.

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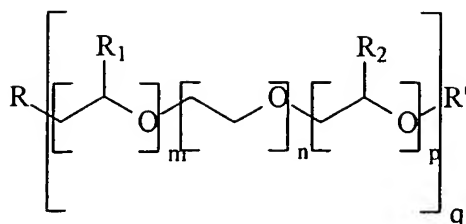
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7- A gloss activator irrespective of the viewing angle, i.e. an angle of between 20° and 85°, and more particularly between 45° and 75°, characterized in that it is a water-soluble, preferably weakly ionic and water-soluble, copolymer, having at least one alkoxy or hydroxy polyalkylene glycol function grafted onto at least one ethylenically unsaturated monomer.

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8- A gloss activator irrespective of the viewing angle, according to claim 7 characterized in that it is a water-soluble, preferably weakly ionic and water-soluble, copolymer consisting of at least one monomer of formula (I):



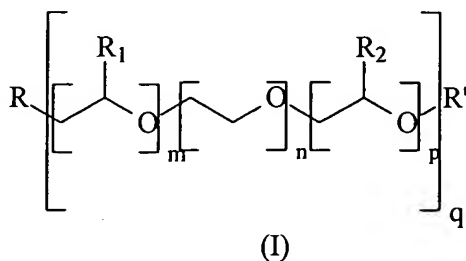
where

- m and p represent a number of alkylene oxide units less than or equal to 150
- 5      - n represents a number of ethylene oxide units less than or equal to 150
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- R<sub>1</sub> represents hydrogen or the methyl or ethyl radical
- R<sub>2</sub> represents hydrogen or the methyl or ethyl radical
- 10      - R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane, α -α' dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of
- 15      allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical
- 20      having from 1 to 4 carbon atoms,

and in that said copolymer has an intrinsic viscosity less than or equal to 100 ml/g determined in accordance with the method known as the intrinsic viscosity method.

- 9- A gloss activator irrespective of the viewing angle according to one of claims 7 or 8,
- 25      characterized in that it is a water-soluble, preferably weakly ionic and water-soluble, copolymer, consisting of:

- a) at least one anionic monomer with a carboxyl or dicarboxyl or sulfonic or phosphoric or phosphonic function or a mixture thereof,
- b) at least one non-ionic monomer, the non-ionic monomer consisting of at least one monomer of formula (I):



where

- m and p represent a number of alkylene oxide units less than or equal to 150
- n represents a number of ethylene oxide units less than or equal to 150
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- R<sub>1</sub> represents hydrogen or the methyl or ethyl radical
- R<sub>2</sub> represents hydrogen or the methyl or ethyl radical
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several monomers of formula (I),

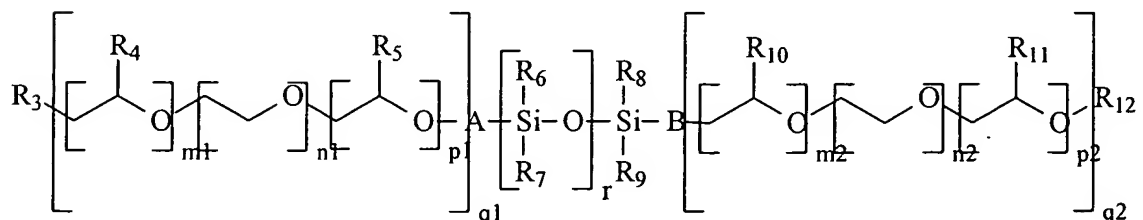
- c) possibly, at least one monomer of the acrylamide or methacrylamide type or their derivatives such as N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, and their mixtures, or at least one non water-soluble monomer such as the alkyl acrylates or methacrylates, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, vinyls such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and their derivatives, or at least one cationic monomer or quaternary ammonium such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulphate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulphate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulphate, dimethyl diallyl ammonium chloride or sulphate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulphate, or at least one organofluorinated or organosilylated monomer, or a mixture of several of these monomers,
- d) possibly, at least one monomer having at least two ethylenic insaturations referred to as a crosslinking monomer,

the total of the proportions of components a), b), c) and d) being equal to 100%.

and in that said copolymer has an intrinsic viscosity less than or equal to 100 ml/g determined in accordance with the method known as the intrinsic viscosity method.

10- A gloss activator irrespective of the viewing angle, according to one of claims 7 to 9, characterized in that the organosilylated monomer is selected from among the molecules of formulae (IIa) or (IIb).

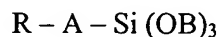
with formula (IIa)



where

- m1, p1, m2 and p2 represent a number of alkylene oxide units less than or equal to 150
- n1 and n2 represent a number of ethylene oxide units less than or equal to 150
- q1 and q2 represent an integer equal to at least 1 and such that  $0 \leq (m1+n1+p1)q1 \leq 150$  and  $0 \leq (m2+n2+p2)q2 \leq 150$ ,
- r represents a number such that  $1 \leq r \leq 200$ ,
- R<sub>3</sub> represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R<sub>4</sub>, R<sub>5</sub>, R<sub>10</sub> and R<sub>11</sub> represent hydrogen or the methyl or ethyl radical
- R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> and R<sub>9</sub> represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof
- R<sub>12</sub> represents a hydrocarbon radical having from 1 to 40 carbon atoms,
- A and B are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

with formula (IIb)



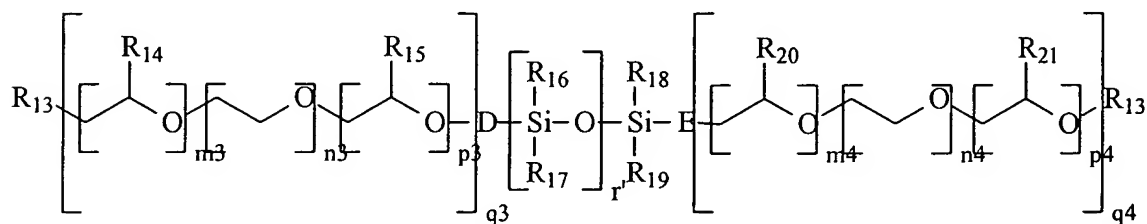
where

- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,

- A is a group which may be present, in which case it represents a hydrocarbon radical having from 1 to 4 carbon atoms,
- B represents a hydrocarbon radical having from 1 to 4 carbon atoms,

5 or a mixture of several of said monomers,

and in that the crosslinking monomer is selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, the allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, 10 tetraallyloxyethane, triallylcyanurates, allyl ethers prepared from polyols such as pentaerythritol, sorbitol, sucrose, or selected from among the molecules of formula (III):



(III)

15 where

- m3, p3, m4 and p4 represent a number of alkylene oxide units less than or equal to 150
- n3 and n4 represent a number of ethylene oxide units less than or equal to 150
- q3 and q4 represent an integer equal to at least 1 and such that  $0 \leq (m3+n3+p3)q3 \leq 150$  and  $0 \leq (m4+n4+p4)q4 \leq 150$ ,
- r' represents a number such that  $1 \leq r' \leq 200$ ,
- R13 represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, 20 maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group 25



of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,

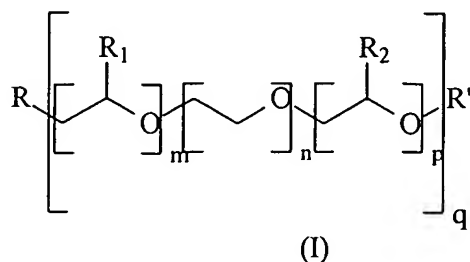
- R<sub>14</sub>, R<sub>15</sub>, R<sub>20</sub> and R<sub>21</sub> represent hydrogen or the methyl or ethyl radical
- R<sub>16</sub>, R<sub>17</sub>, R<sub>18</sub> and R<sub>19</sub> represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof
- D and E are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several of said monomers,

11- A gloss activator irrespective of the viewing angle according to one of the claims 7 to 10 characterized in that it is a water-soluble, preferably weakly ionic and water-soluble, copolymer, consisting, by weight, of:

- a) from 2% to 95%, and more particularly from 5% to 90%, of at least one ethylenically unsaturated anionic monomer having a monocarboxyl function selected from among the ethylenically unsaturated monomers having a monocarboxyl function such as acrylic or methacrylic acid or hemiesters of diacids such as C<sub>1</sub> to C<sub>4</sub> monoesters of maleic or itaconic acid, or mixtures thereof, or having a dicarboxyl function selected from among the ethylenically unsaturated monomers having a dicarboxyl function such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or anhydrides of carboxyl acids, such as maleic anhydride or having a sulfonic function selected from among the ethylenically unsaturated monomers having a sulfonic function such as acrylamido-methyl-propane-sulfonic acid, sodium methallylsulfonate, vinylsulfonic acid and styrenesulfonic acid or having a phosphoric function selected from among the ethylenically unsaturated monomers having a phosphoric function such as vinylphosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and their ethoxylates or having a phosphonic function selected from among the ethylenically unsaturated monomers having a phosphonic function such as vinylphosphonic acid, or mixtures thereof,

b) from 2 to 95% and, more particularly, from 5% to 90%, of at least one non-ionic ethylenically unsaturated monomer of formula (I):

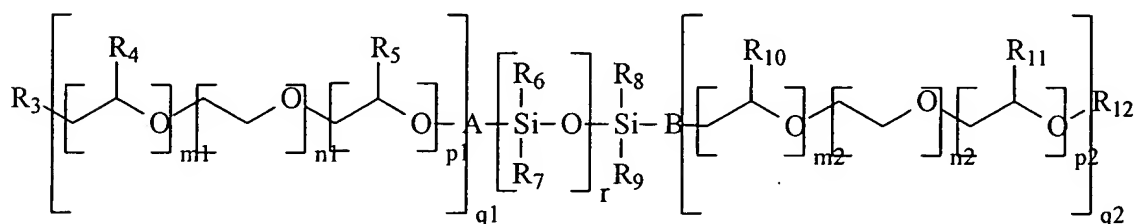


where

- 5                    - m and p represent a number of alkylene oxide units less than or equal to 150
- n represents a number of ethylene oxide units less than or equal to 150
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- 10                  - R<sub>1</sub> represents hydrogen or the methyl or ethyl radical
- R<sub>2</sub> represents hydrogen or the methyl or ethyl radical
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane, α -α' dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- 15                  - R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical having from 1 to 4 carbon atoms,
- 20                  or a mixture of several monomers of formula (I),

25                  c) from 0% to 50% of at least one monomer of the acrylamide or methacrylamide type or their derivatives such as N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, and their mixtures, or at least one non water-soluble monomer such as the alkyl acrylates or methacrylates, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl]

10



15

- m1, p1, m2 and p2 represent a number of alkylene oxide units less than or equal to 150
- n1 and n2 represent a number of ethylene oxide units less than or equal to 150
- q1 and q2 represent an integer equal to at least 1 and such that  $0 \leq (m1+n1+p1)q1 \leq 150$  and  $0 \leq (m2+n2+p2)q2 \leq 150$ ,
- r represents a number such that  $1 \leq r \leq 200$ ,
- R<sub>3</sub> represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$ -dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R<sub>4</sub>, R<sub>5</sub>, R<sub>10</sub> and R<sub>11</sub> represent hydrogen or the methyl or ethyl radical
- R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub> and R<sub>9</sub> represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof
- R<sub>12</sub> represents a hydrocarbon radical having from 1 to 40 carbon atoms.

- A and B are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

with formula (IIb)

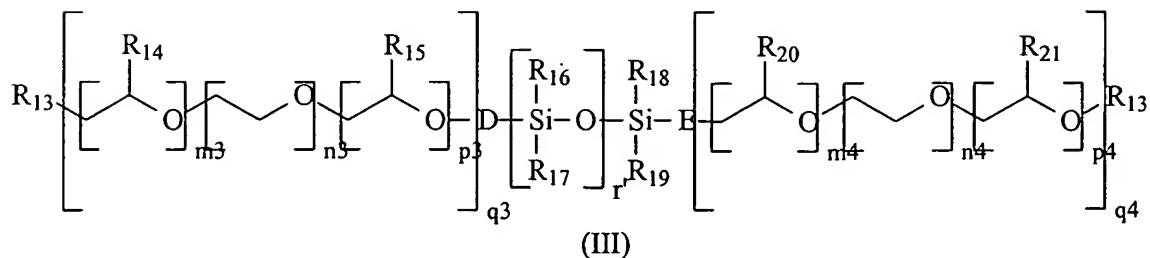


where

- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- A is a group which may be present, in which case it represents a hydrocarbon radical having from 1 to 4 carbon atoms,
- B represents a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several of said monomers,

- d) from 0% to 3% of at least one crosslinking monomer selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, the allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetraallyloxyethane, triallylcyanurates, allyl ethers prepared from polyols such as pentaerythritol, sorbitol, sucrose, or selected from the molecules of formula (III):



where

- m3, p3, m4 and p4 represent a number of alkylene oxide units less than or equal to 150
- 5      - n3 and n4 represent a number of ethylene oxide units less than or equal to 150
- q3 and q4 represent an integer equal to at least 1 and such that  $0 \leq (m3+n3+p3)q3 \leq 150$  and  $0 \leq (m4+n4+p4)q4 \leq 150$ ,
- r' represents a number such that  $1 \leq r' \leq 200$ ,
- 10      - R<sub>13</sub> represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group
- 15      of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R<sub>14</sub>, R<sub>15</sub>, R<sub>20</sub> and R<sub>21</sub> represent hydrogen or the methyl or ethyl radical
- R<sub>16</sub>, R<sub>17</sub>, R<sub>18</sub> and R<sub>19</sub> represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof
- 20      - D and E are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several of said monomers,

- 25      the total of the proportions of components a), b), c) and d) being equal to 100%.  
and in that it is a copolymer of intrinsic viscosity less than or equal to 100 ml/g determined in accordance with the method known as the intrinsic viscosity method.

- 30      12- A gloss activator irrespective of the viewing angle according to one of claims 7 to 11, characterized in that it is a copolymer is in its acid form or fully or partially neutralized by one or more neutralizing agents having a monovalent neutralizing function or a polyvalent neutralizing function such as, for the monovalent function, those selected from among the group consisting of the alkaline cations, in particular

sodium, potassium, lithium, ammonium or the primary, secondary or tertiary aliphatic and/or cyclic amines such as stearylamine, the ethanolamines (mono-, di-, triethanolamine), mono and diethylamine, cyclohexylamine, methylcyclohexylamine, aminomethylpropanol, morpholine or, for the polyvalent function, those selected from  
5 among the group consisting of alkaline earth divalent cations, in particular magnesium and calcium, or zinc, and of the trivalent cations, including in particular aluminium, or of certain cations of higher valency.

13- A method for the dispersion in aqueous suspension of mineral matter,  
10 characterized in that use is made of the copolymer according to one of the claims 1 to 6.

14- A method for the dispersion in aqueous suspension of mineral matter according to claim 13, characterized in that use is made of 0.05% to 5% by dry weight of said  
15 copolymer with respect to the dry weight of the fillers and/or pigments, and, more particularly, in that use is made of from 0.1% to 2.5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

15- A method for the dispersion in aqueous suspension of mineral matter according to  
20 one of the claims 13 or 14, characterized in that the mineral matter is selected from among calcium carbonate, dolomites, kaolin, calcine kaolin, talc, gypsum, titanium oxide, satin white or aluminium trihydroxide, mica and the mixture of these fillers, such as talc-calcium carbonate or calcium carbonate-kaolin mixtures, or mixtures of calcium carbonate with aluminium trihydroxide, or mixtures with synthetic or natural  
25 fibres or co-structures of minerals such as talc-calcium carbonate or talc-titanium dioxide co-structures, and is more particularly of calcium carbonate such as natural calcium carbonate selected from among marble, calcite, chalk or their mixtures.

16- An aqueous suspension of mineral matter, characterized in that it contains said  
30 copolymer and more particularly in that it contains 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and more particularly in that it contains 0.1% to 2.5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

- 17- An aqueous suspension of mineral matter dispersed according to claim 16, characterized in that the mineral matter is selected from among calcium carbonate, dolomites, kaolin, calcine kaolin, talc, gypsum, titanium oxide, satin white or aluminium trihydroxide, mica and the mixture of these fillers, such as talc-calcium carbonate or calcium carbonate-kaolin mixtures, or mixtures of calcium carbonate with aluminium trihydroxide, or mixtures with synthetic or natural fibres or co-structures of minerals such as talc-calcium carbonate or talc-titanium dioxide co-structures, and is more particularly of calcium carbonate such as natural calcium carbonate selected from among marble, calcite, chalk or their mixtures.
- 18- A method for the grinding in aqueous suspension of mineral matter, characterized in that use is made of the copolymer according to one of the claims 1 to 6.
- 19- A method for the grinding in aqueous suspension of mineral matter according to claim 18, characterized in that use is made of said 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and, more particularly, in that use is made of 0.1% to 2.5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.
- 20- A method for the grinding in aqueous suspension of mineral matter according to one of the claims 18 or 19, characterized in that the mineral matter is selected from among calcium carbonate, dolomites, kaolin, calcine kaolin, talc, gypsum, titanium oxide, satin white or aluminium trihydroxide, mica and the mixture of these fillers, such as talc-calcium carbonate or calcium carbonate-kaolin mixtures, or mixtures of calcium carbonate with aluminium trihydroxide, or mixtures with synthetic or natural fibres or co-structures of minerals such as talc-calcium carbonate or talc-titanium dioxide co-structures, and is more particularly of calcium carbonate such as natural calcium carbonate selected from among marble, calcite, chalk or their mixtures.
- 21- An aqueous suspension of ground mineral matter, characterized in that it contains said copolymer and more particularly in that it contains 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and more particularly in that it contains 0.1% to 2.5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

22- An aqueous suspension of mineral matter ground according to claim 21, characterized in that the mineral matter is selected from among calcium carbonate, dolomites, kaolin, calcine kaolin, talc, gypsum, titanium oxide, satin white or aluminium trihydroxide, mica and the mixture of these fillers, such as talc-calcium carbonate or calcium carbonate-kaolin mixtures, or mixtures of calcium carbonate with aluminium trihydroxide, or mixtures with synthetic or natural fibres or co-structures of minerals such as talc-calcium carbonate or talc-titanium dioxide co-structures, and is more particularly of calcium carbonate such as natural calcium carbonate selected from among marble, calcite, chalk or their mixtures.

23- The use of the aqueous suspension of mineral matter according to any one of claims 16 and 17 or 21 and 22 in the paper industry and more particularly in paper coating.

24- A coating colour manufacturing method, characterized in that use is made of the copolymer according to one of the claims 1 to 6.

25- A coating colour manufacturing method according to claim 24, characterized in that use is made of 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and, more particularly, in that use is made of 0.1% to 2.5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

26- A coating colour, characterized in that it contains said copolymer and more particularly in that it contains 0.05% to 5% by dry weight of said copolymer with respect to the total dry weight of the mineral matter, and yet more particularly 0.1% to 2.5% by dry weight of said copolymer with respect to the total dry weight of the mineral matter.

27- A coated paper, characterized in that it contains the copolymer according to any one of claims 1 to 6.



28- A composition of paint, characterized in that it contains the copolymer according to any one of claims 1 to 6.

5 29- A composition of plastic characterized in that it contains the copolymer according to any one of claims 1 to 6.